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Choosing one at a time? Presenting options simultaneously helps people make more optimal decisions than presenting options sequentially

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ABSTRACT

This research examines an element of choice architecture that has received little attention—whether options are presented simultaneously or sequentially. Participants were more likely to choose dominating options when the options were presented simultaneously rather than sequentially, both when the dominance relationship was transparent (Experiment 1) and when it was not (Experiments 2–3). Depth of cognitive processing mediated the effect of option presentation on optimal choice (Experiment 4). Memory load was unlikely to be the underlying mechanism, as individual differences in working memory span did not predict optimal choice in the sequential condition (which places a greater memory load; Experiment 5), and manipulations of memory load did not reduce the benefits of simultaneous presentation (Experiments 6a–6c). Instead, participants' working memory span predicted optimal choice in the simultaneous condition (which allows for more in-depth processing; Experiment 5), and a manipulation of processing load eliminated the benefits of simultaneous presentation (Experiment 7).

1. Introduction

Imagine Susan, a 23 year old woman, who quit her job and opened a start-up in 2012. Upon losing her employer-provided insurance, she visited the websites of numerous insurance providers, one at a time, viewed the plans that they offered, and then finally chose a health insurance plan. Now imagine Sarah, a 23 year old woman who quit her job to open a start-up in 2014. Instead of visiting the website of each and every insurance provider, Sarah went to www.healthcare.gov, entered her information, and saw a big table listing all the health insurance plans that she was eligible for, along with their values on various attributes. Assuming that the plans that Susan and Sarah were eligible for were identical, who would be more likely to choose the plan that best met her needs?

Both types of choices described above are common in people's everyday lives. In many cases, decision makers make a choice after considering options one at a time. For example, hiring managers typically interview one candidate at a time before selecting one for the position. Journal editors typically receive and consider one manuscript at a time. Other times, decision makers make a choice with all options laid out at the same time. For example, for journal special issues, guest editors typically consider multiple manuscripts submitted at the same time and then select a subset. Often times, people have a choice of whether to consider multiple options sequentially or simultaneously. For example, when buying electronic products online, people can view the specifications of each product at a time by going to the product's webpage, or by using a *compare products* function to view multiple options simultaneously. Similarly, investors choosing a mutual fund may study one fund at a time, or compare multiple mutual funds all laid out together. Could viewing options all together rather than one at a time help or hurt managers hire better job candidates, journals select more high quality papers, consumers buy better products, and investors choose more profitable mutual funds? We investigate this possibility in the present research.

To assess the extent to which people encounter options that are presented sequentially vs. simultaneously in real life, we explored websites of the top 10 car manufacturers (Statista, 2016) and the top 10 life insurance providers (National Association of Insurance

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Commissioners, 2016) in the US, in terms of market share. All car manufacturers' and life insurance providers' websites had individual web pages for each of their products, allowing customers to view options one at a time. However, they differed in the extent to which customers could view multiple products simultaneously. Four car manufacturers allowed consumers to view multiple cars together but showed only two attributes—price and mileage—instead of more than 20 attributes that are used to describe cars. All car manufacturers featured a *compare products* tool. However, reaching this tool was not straightforward. Compared to the webpages for individual products, which could be accessed by 1.1 clicks ($SD = 0.3$) after landing on the homepage, a visitor would have to make 2.7 clicks ($SD = 0.46$) to reach the comparison tool. Furthermore, people could compare only 3.5 cars ($SD = 0.67$) at a time. On the other hand, six insurance providers featured a comparative table listing all their products, and one company provided a comparison tool that required five clicks from the home page and could be used to compare three of six available policies. Three insurance providers exclusively displayed their products on individual pages. These analyses suggest that the default format in which consumers acquire information about products varies both across and within different purchase domains. Further, when given the option, people can typically compare only a few options on a few attributes simultaneously, but have to sequentially view one product at a time if they want detailed information.

The decision of whether to present options sequentially or simultaneously is a key element of choice architecture (Thaler & Sunstein, 2008), which refers to the fact that "there are many ways to present a choice to the decision-maker, and that what is chosen often depends upon how the choice is presented" (Johnson et al., 2012, p. 488). Researchers have investigated numerous elements of choice architecture that influence decisions, such as the number of alternatives (Cronqvist & Thaler, 2004), the presence of defaults (Johnson & Goldstein, 2003), the categories in which the options are grouped (Fox, Ratner, & Lieb, 2005), and the units used to describe attributes (Larrick & Soll, 2008). We investigate an element of choice architecture that has received little attention in past research—whether options are presented simultaneously or sequentially (see Bohnet, Van Geen, & Bazerman, 2015; Mogilner, Shiv, & Iyengar, 2013, for exceptions).

Our key hypothesis is that when people choose among simultaneously presented options, they would make more optimal decisions than when they choose among sequentially presented options. The rationale behind this prediction is that when individuals consider options simultaneously, the key attributes on which the options differ from one another are easier to compare, thus allowing them to engage in more in-depth cognitive processing about the options. In other words, we predict that viewing options simultaneously would lead decision makers to process the options more comprehensively and analytically, such as by examining the relative advantages and disadvantages of the options and integrating the relevant information (Maheswaran & Chaiken, 1991; Maheswaran & Meyers-Levy, 1990). This more comprehensive, extensive, and in-depth processing, in turn, would help them identify the optimal option. Although past research has not examined this question, we review the extant literature on sequential vs. simultaneous option presentation.

2. Simultaneous versus sequential option presentation

2.1. Strategic decision making

Although research has not explicitly tested whether people make better decisions when they consider options sequentially vs. simultaneously, some research on strategic decision making is consistent with this idea. Gemünden and Hauschildt (1985) obtained detailed minutes of 83 decisions that the executive board of a mid-size German company made over an 18-month period. They noted the number of options that each decision involved: 40% were whether-or-not decisions involving single options considered individually, and 55% were decisions involving two options considered simultaneously. Eight years later, the executive board was asked to evaluate the quality of each of the 83 decisions. Strikingly, executives rated the initial decision as being "very good" 43% of the time when it involved two options, but only 6% of the time when it involved a single option. Although this study was not a controlled experiment, this finding suggests the intriguing possibility that when people consider multiple options simultaneously, they might make better decisions than when they consider options one at a time (see Heath & Heath, 2013 for an additional discussion).

2.2. Consumer decision making

Recent research has more specifically investigated people's choices among sequentially versus simultaneously presented options. Mogilner et al. (2013) found that when consumers chose among sequentially presented hedonic options (e.g., chocolate, wine), they were less satisfied with their chosen option than when they chose among simultaneously presented options. For example, individuals presented with descriptions of five chocolates and asked to choose one were subsequently happier with their choice and less likely to change their choice compared to those who were presented with the descriptions one at a time. The rationale for this finding was that when presented with options sequentially, individuals hope that they would encounter an even better option subsequently, which makes them dissatisfied with their chosen option. However, when options are presented simultaneously, the question of hoping for a better option does not even arise, and thus people are more satisfied with their chosen option.

Our research differs from this work in important ways. Mogilner et al. (2013) examined choice among hedonic stimuli that cannot be broken down into attributes (e.g., chocolate, wine), and are thus holistically perceived and judged based on their subjective properties as perceived by the chooser. Instead, we study choice among quantifiable stimuli that are specified in terms of numerically represented attributes and judged based on their objective attributes. Further, among hedonic options, people are entitled to choose whatever they fancy, so there is no optimal option. Instead, we investigate cases in which there is a normatively correct option that should not be influenced by people's idiosyncratic preferences. Finally, Mogilner et al.'s key outcome was choice satisfaction and choice commitment, whereas our key outcome is whether people choose the optimal option. Thus, the present research studies choice stimuli (attribute-based vs. holistic), mechanisms (cognitive processing vs. hope), and decision outcomes (optimal choice vs. post-choice satisfaction) that are distinct from those studied by Mogilner et al. (2013).

An extensive body of research has examined a related phenomenon—how presenting a single option versus multiple options influences people's evaluations of the options (Hsee & Zhang, 2010). The typical paradigm in this stream of research is to show some participants either one of two different options (e.g., either one of two different test scores; the *separate evaluation* conditions), and to show a third group of participants both the options (e.g., two test scores presented together; the *joint evaluation* condition; Hsee, 1996). This research has found that people's evaluation of options violate basic economic principles in single evaluation but not in joint evaluation (Hsee & Zhang, 2010, but see Sher & McKenzie, 2014, for arguments on why such an inconsistency might be rational). Our research differs from the literature on single vs. joint evaluation in two key ways. First, both sequential and